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**FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY**

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Redesignation of the 17.7-19.7 GHz)	
Frequency Band, Blanket Licensing)	IB Docket No. 98-172
of Satellite Earth Stations in the)	RM-9005
17.7-20.2 GHz and 27.5-30.0 GHz)	RM-9118
Frequency Bands, and the Allocation)	
of Additional Spectrum in the)	
17.3-17.8 GHz and 24.75-25.25 GHz)	
Frequency Bands for Broadcast)	
Satellite-Service Use)	

**COMMENTS OF
THE BOEING COMPANY**

The Boeing Company ("Boeing"), by its attorneys and pursuant to Section 1.415 of the Commission's Rules, 47 C.F.R. § 1.415, hereby comments on the above referenced Notice of Proposed Rule Making (hereinafter "NPRM" or "Ka-band Earth Station Licensing Proceeding").

I. INTRODUCTION

Boeing is a global leader in space and satellite technology, providing design, construction and launch services for numerous government and commercial systems.¹

¹ Boeing also has pending before the Commission an application to launch and operate a medium earth orbit ("MEO") satellite system to provide aeronautical communication and navigation services on a global basis. See Application for Authority to Construct, Launch and Operate a Non-Geosynchronous Satellite System in the 2 GHz Mobile-Satellite Service and the Aeronautical Radionavigation-Satellite Service, FCC File No. 179-SAT-P/LA-97, 90-SAT-AMEND-98 (Sept. 26, 1997).

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List A B C D E

Because of Boeing's substantial involvement in the aerospace and satellite industries, Boeing has a significant interest in supporting the adoption of rules and licensing policies designed to increase the total number of competitive satellite systems that can operate in scarce spectrum.

The Commission's Ka-band Earth Station Licensing Proceeding addresses numerous important band utilization and licensing questions. Resolution of these matters will have a significant impact on satellite and terrestrial licensees in the Ka-band and is likely to have a precedential impact on licensees in other bands. In the interest of conserving Commission resources, however, Boeing will refrain from commenting at this time on many of the policy issues addressed in the NPRM. Boeing's silence should not be construed as acquiescence. Furthermore, Boeing reserves the right to submit reply comments addressing policy issues covered in the NPRM if such comments are deemed warranted.

Boeing will restrict its first round comments to various technical issues relevant to the Commission's overall goal of promoting spectrum efficiency. Boeing urges the Commission to consider Boeing's technical recommendations in order to increase the total number of spectrum users that can provide innovative new services to consumers on a co-frequency basis in the Ka-band.

II. THE COMMISSION SHOULD PROMOTE SPECTRUM EFFICIENCY BY ADOPTING A SINGLE ANTENNA PERFORMANCE STANDARD FOR EARTH-TO-SPACE COMMUNICATIONS WITH SATELLITES IN GEOSTATIONARY ORBIT.

The global satellite industry is on the verge of a new age in spectrum efficiency in which geostationary ("GSO") and non-geostationary ("NGSO") satellite systems will operate co-frequency without resulting in harmful interference. Unfortunately, Section

25.209 of the Commission's rules pre-dates these developments and, as a result, fails to accommodate these new spectrum-sharing opportunities.

Section 25.209 specifies transmission earth station antenna performance standards designed to protect adjacent GSO satellite systems operating on a co-frequency basis. The performance standards in Section 25.209 are adequate to protect GSO systems, but are inadequate to fully protect co-frequency NGSO systems. Specifically, Section 25.209 permits earth stations to use antennas with reduced performance standards outside the plane of the GSO orbit. These inefficient performance standards will result in interference into NGSO systems without providing significant associated benefits to GSO licensees or earth station operators communicating with GSOs.

The current earth station antenna performance standards were adopted pursuant to the Commission's 2° spacing policy. That policy is based on the Commission's recognition that requiring the use of spectrum efficient transmit/receive antennas promotes the public interest by increasing the total capacity of scarce spectrum resources. The Commission observed that "the best way to accommodate increased demand for satellite transponder capacity would be to maximize the use of the orbit by providing for the launch of more satellites."²

The Commission should reach this same conclusion with respect to transmit earth station antenna performance standards outside the GSO plane. Specifically, the Commission should amend Section 25.209 so that the sidelobe performance currently applicable to transmit earth station antenna operations in the plane of the GSO orbit is

² *C-Band Satellite Orbital Spacing Policies*, 7 FCC Rcd 456, 456 (1992) (citing *Domestic Fixed Satellite Service*, 88 FCC 2d 318 (1981)).

made equally applicable in all other planes. Such a change in the rules would increase spectrum efficiency by enabling NGSO systems to more readily operate co-frequency with GSO licensees.

In urging the Commission to amend Section 25.209 of its rules, Boeing acknowledges that in portions of the Ka-band (“28.35-28.6 GHz and 29.5-30 GHz”) NGSO systems operate in the United States on a secondary basis to GSO licensees. Enabling secondary operations, however, furthers the public interest by increasing the number of competitive systems that can share the same spectrum. Thus, the Commission should not permit operators of primary services to emit unnecessary interference into secondary systems if such interference can easily be avoided through the use of spectrum efficient transmitting antennas.

Furthermore, NGSO FSS satellite systems are inherently global in nature. Even though such systems will be required to operate on a secondary basis in portions of the Ka-band in the United States, they are likely to operate on a co-primary basis in the rest of the world. The construction of global satellite systems promotes the Commission’s goals of making telecommunications services universally available and increasing employment in the United States through the export of global satellite infrastructure. Thus, the Commission should take steps to assist global sharing opportunities by adopting antenna performance standards that provide reasonable protection for NGSO systems, even in bands where NGSOs operate on a secondary basis.

III. THE COMMISSION SHOULD PROMOTE SPECTRUM EFFICIENCY BY MAINTAINING THE CURRENT MINIMUM BEAMWIDTH FOR EARTH STATION ANTENNAS.

The Commission should also refrain from relaxing the minimum beamwidth for earth station antennas communicating with GSOs in the Ka-band. As discussed above, the Commission's earth station antenna performance standards were developed to increase spectrum efficiency and maximize the number of satellite systems that can share scarce spectrum. A more relaxed antenna beamwidth could inhibit GSO/NGSO sharing without resulting in significant associated benefits for GSO licensees. Thus, the Commission should maintain the current 1° standard for earth stations communicating with GSO satellites in the Ka-band.

IV. THE COMMISSION CAN REMEDY ANY CONCERNS ABOUT EARTH STATION ANTENNA POINTING ACCURACY THROUGH THE USE OF AUTOMATIC TRANSMITTER IDENTIFICATION SYSTEMS.

Finally, in the NPRM the Commission addresses the importance of accurate earth station transmit antenna pointing in order to avoid interference into adjacent satellite systems. The NPRM suggests several possible means to address pointing accuracy concerns. The Commission refrains, however, from proposing the adoption of a specific solution.

Boeing believes that Ka-band licensees can be expected to employ adequate measures to ensure that earth station antennas are designed, constructed, installed and maintained in a manner that avoids interference into adjacent satellite systems. Thus, the Commission should refrain from adopting rules regulating earth station antenna pointing accuracy until evidence is developed indicating that a problem exists.

If it does become apparent that earth station antenna pointing accuracy may be a problem in the Ka-band, the Commission can fully address the problem by mandating the use of automatic transmitter identification systems. Such identification systems can enable adjacent licensees to rapidly identify the source of any adjacent system interference that may develop and request cessation of the offending transmissions. At the same time, automatic transmitter identification systems can be incorporated in mass-marketed uplink transmitters without significantly increasing the cost of such systems. In contrast, other solutions suggested in the NPRM may result in excessive expenses for Ka-band licensees, interfering with their ability to bring affordable broadband communication services to consumers.


V. CONCLUSION

For the reasons stated herein, the Commission should employ the technical measures and initiatives outlined by Boeing in its comments in order to increase the total

number of spectrum users that can provide innovative new services to consumers on a co-frequency basis.

Respectfully submitted,

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November 19, 1998